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PENSOFT

EVOLUTIONARY SYSTEMATICS

On three new species of jumping spiders of the genera *Habrocestum* Simon, 1876, *Stenaelurillus* Simon, 1886 and *Tamigalesus* Żabka, 1988 (Araneae, Salticidae) from Sri Lanka

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http://zoobank.org/68F9C8F3-2145-41D2-96D9-6781CFC5C4B0

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Abstract

Three new species of litter-dwelling jumping spiders, *Habrocestum liptoni* **sp. nov.**, *Stenaelurillus ilesai* **sp. nov.**, and *Tamigalesus fabus* **sp. nov.** are described from Sri Lanka. In addition, *T. munnaricus* is redescribed based on the new material from Sri Lanka.

Key Words

Biodiversity, leaf litter, new species, taxonomy, India, South Asia, Arachnida.

Introduction

This paper describes three new litter dwelling salticids of the genera *Habrocestum* Simon 1876, *Stenaelurillus* Simon 1886 and the endemic genus, *Tamigalesus* Żabka, 1988. *Habrocestum* was first recorded in Sri Lanka in 2016 (Kanesharatnam and Benjamin 2016). Three endemic species of this genus are currently known from Sri Lanka (World Spider Catalog 2019). Here, we describe a fourth. The genus *Stenaelurillus* was previously represented by two species: *S. belihuloya* Logunov & Azarkina, 2018 and *S. lesserti* Reimoser, 1934 (World Spider Catalog 2019). However, until now the presence of the later species in Sri Lanka was taken at face value. Here, we described the material from Sri Lanka as a new species and provide a deferential diagnosis to separate it from *S. lesserti*. *Tamigalesus* Żabka, 1988 was previously monotypic. It was described based on three specimens found in the E. Simon collection in Museum National d'Histoire Naturelle, Paris. The occurrence in Sri Lanka of *T. munnaricus* Żabka, 1988 was doubted as the specimens were found in a vial of several other specimens of at least one other species (Żabka 1988). Here, we redescribe the type species, describe a new species and provide new data on their distribution based on material collected in Sri Lanka.

Material and methods

Methodology and taxonomic descriptions are based on the format of Benjamin and Kanesharatnam (2016), Kanesharatnam and Benjamin (2016). Sampling was primarily done by sifting litter and keeping the residue overnight in a Winkler extractor. Alternatively, a heap of dead leaves was scooped from the forest floor and spread on a white sheet. Spiders were then collected either by hand or an aspirator. The collected specimens were preserved in 70% ethanol and examined using an Olympus SZX7 stereomicroscope (World Spider Catalog 2019). Female genitalia were excised and digested with Sigma Pancreatin LP 1750 enzyme complex, in a solution of sodium borate (Dingerkus and Uhler 1977). Male palps and female epigynes were cleared and mounted with methyl salicyclate for further examination. Illustrations of male palps, epigynes and vulvae were made with the aid of a drawing tube attached to an Olympus BX51 compound microscope. Either a Nikon D80 or a

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D7000 camera with a macro lens was used to take photographs of live spiders. Photographs of palps, epigynes and intact spiders were taken with a Leica MC170 HD camera mounted on a Leica M205C stereomicroscope using the Leica Application Suite software (Leica Microsystems Limited, Germany) and merged with Helicon Focus image stacking software (version 6, Helicon soft Ltd). Images were then edited with Adobe Photoshop CC and assembled using Adobe Illustrator CS6. All measurements are in millimeters. All specimens unless otherwise stated are deposited in National Museum of Sri Lanka.

Abbreviations

Morphology

AL abdominal length; **ALEs** anterior lateral eyes; **AMEs** anterior median eyes; **AW** abdominal width; **PL** prosoma length; **PLEs** posterior lateral eyes; **PW** prosomal width; **RTA**: retrolateral tibial apophysis; **TL**: total length.

Institutions

DFC Department of Forest Conservation; **DWLC** Department of Wildlife Conservation; **NIFS** National Institute of Fundamental Studies.

Taxonomy

Habrocestum Simon, 1876

Habrocestum Simon, 1876: 132. Type species *Habrocestum pullatum* Simon, 1876: 132.

Description. Small litter-dwelling jumping spiders. Prosoma longer than abdomen. Palp with single RTA (Kanesharatnam and Benjamin 2016). Bulbus elongated. Shape of embolus is species specific arising under tegulum. Tegular ledge clearly visible (Figs 1D, 3A; Kanesharatnam and Benjamin 2016). Conductor present or absent (Wunderlich 2008). Epigynum with vaginal roof (epigynal pocket) with shallow or deep notch at posterior edge (Figs 2C–E, 3C–D). Copulatory opening large, bilaterally situated. Membranous "window" large and transverse (Prószyński 2003). Some species possess distinct accessory glands (See Kanesharatnam and Benjamin 2016 for a detailed diagnosis).

Habrocestum liptoni sp. nov.

http://zoobank.org/E34D4A13-9307-4301-B177-A53A86FA7040

Figs 1A–E, 2A–E, 3A–D

Type material. Male holotype from Sri Lanka, Central Province, Kandy District, Deltota, Loolecondera estate, 1480m, 07°08'45"N, 80°41'53"E, beating, 22 June 2016, leg. N. Athukorala and S. Ranasinghe (IFS_SAL_827).

Paratype. One female, same locality and collection data as in holotype, 25 January 2011, leg. S.P. Benjamin and S. Batuwita. (IFS_SAL_466).

Other material examined. 1 male; same locality and collection data as in holotype (IFS_SAL_828).

Diagnosis. This species is similar to *H. kodigalaensis* Kanesharatnam & Benjamin 2016 in the shape of RTA and bulbus. However, it is distinguishable by the broad, retrolaterally curved embolus (Figs 1D, 3A), rounded bulbus with comparably small proximal lobe of tegulum in males (Figs 1C–E, 3A–B) and large, rounded membranous "window" (Figs 2C, 3C), absence of accessory glands and multi-chambered large spermathecae (Figs 2D–E, 3D).

Etymology. The species name is dedicated to Scotsman Thomas (Tommy) Lipton who was pioneer tea merchant in Sri Lanka.

Description. *Male (holotype):* In alcohol preserved specimen, prosoma blackish brown, longer than wide (Fig. 1A). Dark brown bristles near front eyes. Ocular region dark and slightly elevated. Eye field short and wide occupying about one-third length of prosoma. Median ocular quadrangle broader than long. Fovea short, distinct. Round and middle depression around fovea behind PLEs. Chelicerae blackish brown with yellowish brown fangs in ethanol preserved specimens (Fig. 1A). Sternum oval shaped with dispersed black colored spots at the edges (Fig. 1B). White and brown hairs sparsely dispersed on lateral prosoma. Lateral and posterior sides of prosoma steeper. Posterior margin of prosoma slightly truncated (Fig. 1A). All legs with yellow and black banding pattern. Femora III much longer than femora IV. Abdomen oval shaped, smaller and narrower than prosoma. Dorsum blackish brown with pale greyish brown stripes and dots (Fig. 1A). Ventrum pale yellowish brown with dark grey blotches and dots. Spinnerets yellowish brown (Fig. 1B). Yellowish brown palp. Palpal tibia with short hook-shaped RTA (Figs 1E, 3A–B). Rounded tegulum with a small proximal lobe protruding posterolaterally beyond the base of cymbium (Figs 1C–E, 3A–B). Broad embolus strongly curved retrolaterally and arising from under tegular ledge (Figs 1D, 3A). Part of sperm duct clearly visible at the distal tegulum. Measurements: TL 2.55, PL 1.38, PW at PLEs 1.00, AL 1.05, AW 0.72.

Female (paratype): All characters as in male, except the following: posterior border of prosoma black and slightly truncated than in male and abdomen is longer than prosoma (Fig. 2A).

Epigyne with small, epigynal pocket with rather deep notch at posterior edge near epigastric furrow (Figs 2C–E, 3C–D). Membranous "window" large, rounded bilaterally arranged at the posterolateral epigynum. Copulatory ducts inconspicuous. Moderately sclerotized multi-chambered spermathecae with thick walls (Figs 2D–E, 3D). Accessory glands absent. Fertilization ducts narrow, originating from top of spermathecae (Figs 2E, 3D). Measurements: TL 4.14, PL 2.00, PW 1.32, AL 2.18, AW 1.44.

Figure 1. *Habrocestum liptoni* sp. nov. **A** habitus, male, dorsal view **B** ventral view **C** palp, prolateral view **D** palp, ventral view **E** palp, retrolateral view. Scale bars: 1 mm (**A–B**); 0.1mm (**C–E**).

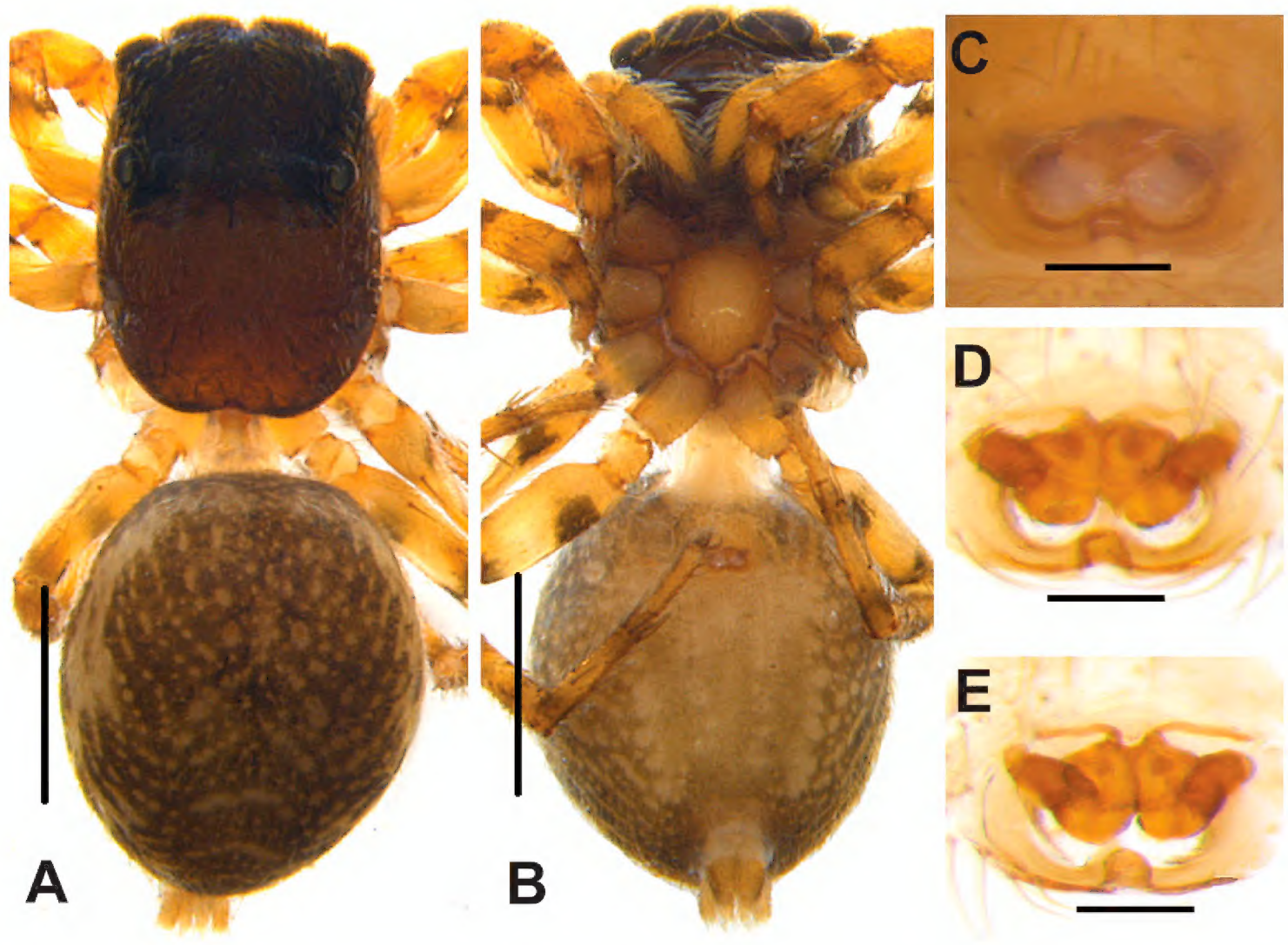

Figure 2. *Habrocestum liptoni* sp. nov. **A** habitus, female, dorsal view **B** ventral view **C–D** epigyne, ventral view. **E.** Vulva, dorsal view. Scale bars: 1 mm (**A–B**), 0.1 mm (**C–E**).

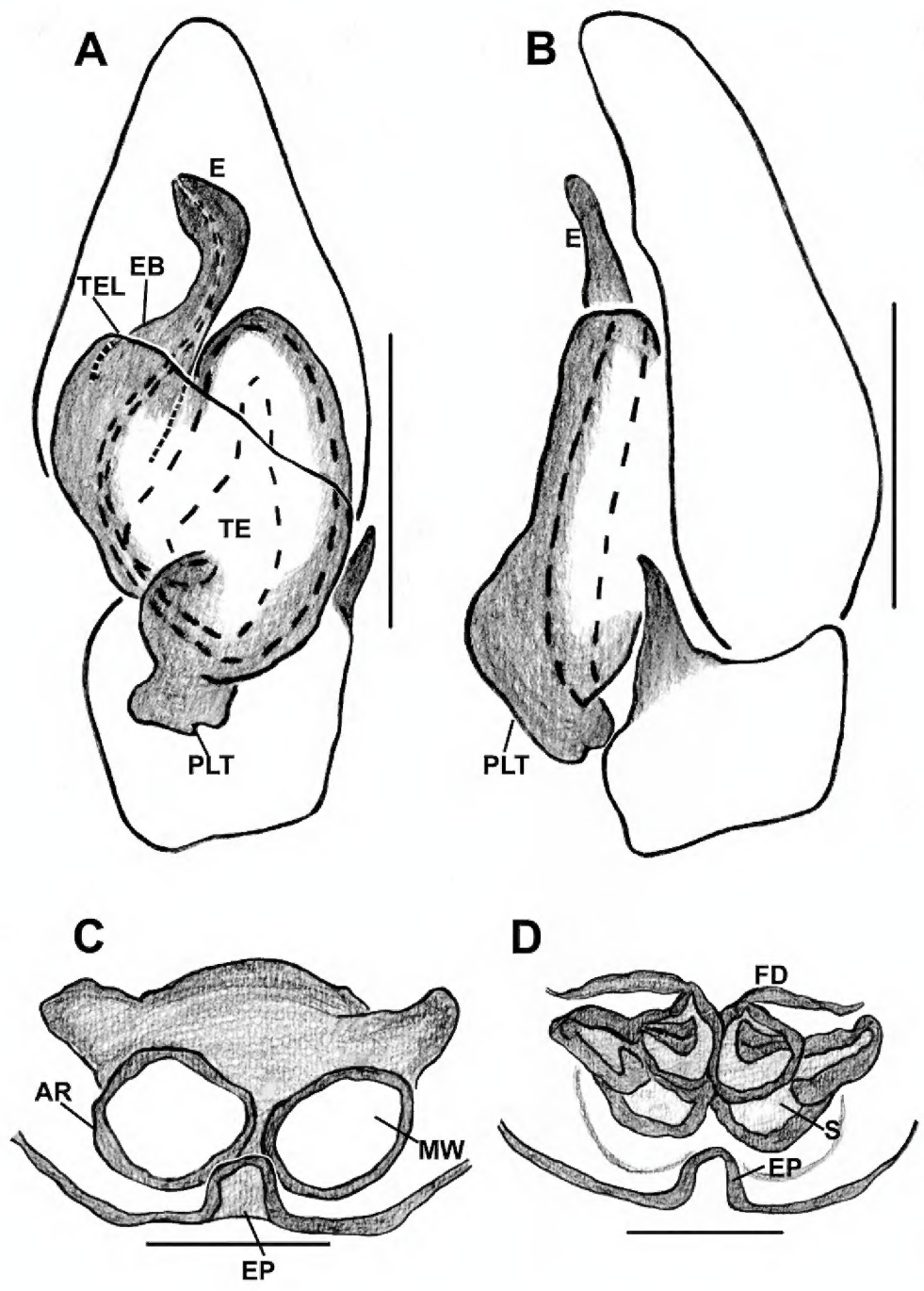

Figure 3. *Habrocestum liptoni* sp. nov. **A** palp, ventral view **B** palp, retrolateral view **C** epigyne, ventral view **D** vulva, dorsal view. Abbreviations: AR, arcuated rim; E, embolus; EB, embolic base; EP, epigynal pocket; FD, fertilization duct; MW, membranous window; PLT, proximal lobe of tegulum; S, spermatheca; TE, tegulum; TEL, tegular ledge. Scale bars: 0.2 mm (**A–B**), 0.1mm (**C–D**).

Stenaelurillus Simon, 1886

Stenaelurillus Simon 1885:351. Type species *Stenaelurillus nigricaudus* Simon 1885: 351.

Description. Body hirsute, dark coloured with broadest prosoma posteriorly. Prosoma dark brown or black with a pair of white longitudinal stripes arising from PLEs or ALEs (Figs 4A, E–F; Logunov and Azarkina 2018; Szűts and Scharff 2005), lateral edges of prosoma also bordered with white stripes (Caleb et al. 2017; Wesołowska 2014b). Anterior abdomen with thick, long brown hairs and one or three white spots on the posterior abdomen (Figs 4A–C, E–F; Logunov and Azarkina 2018; Wesołowska 2014a, b). In male palp, bulbus oval with a triangular posterior tegular apophysis (Figs 5F, 7B–C; Caleb et al. 2017; Szűts and Scharff 2005; Wesołowska 2014b). Short embolus accompanied by one or two tegular apophyses (Wesołowska 2014a, b). In some species, palpal tibia dorsally decorated by black or white, feather-shaped bristles. Spherical or oval spermathecae (Figs 6E, 7E; Caleb et al. 2017).

Stenaelurillus ilesai sp. nov.

http://zoobank.org/CB89DFD6-0BD0-4C4B-89DF-977DCC7F9EE7

Figs 4A–H, 5A–F, 6A–E, 7A–E

Stenaelurillus lesserti Reimoser, 1934: Wesołowska 2014a: fig. 2A (male from Hambantota, Sri Lanka). Misidentification.

Stenaelurillus lesserti Reimoser, 1934: Logunov and Azarkina 2018: figs 87–89, 336. 337 (female from Pollonaruwa, Sri Lanka). Misidentification.

Remarks. *S. lesserti* was described based on Indian material only (Reimoser 1934). When the species was redescribed a male from Sri Lanka was incorporated in to the redescription with the species purported to be newly recorded from the island (Wesołowska 2014a). This error was repeated in Logunov and Azarkina (2018) albeit with a remark that raised some doubt on the matching of sexes by the previous authors. This is all in spite of clear diagnosable differences in palps of males from India and Sri Lanka; see illustrations in Wesołowska (2014a) and here.

Type material. Male holotype from Sri Lanka, North Central Province, Anuradhapura District, Mihintale Sanctuary, 300m, 08°21'02.14"N, 80°31'01"E, 06 July 2013, hand collection, leg. I. Sandunika (IFS_SAL_307).

Paratype. One female, same locality and collection data as in holotype (IFS_SAL_308).

Other material examined. 4 females, same locality and collection data as in type material (IFS_SAL_309-312); 1 male, 2 females, same locality and collection data as in type material, 20 May 2013, leg. S.P. Benjamin et al. (IFS_SAL_643-645); 1 female, Anuradhapura District, Allepothana, Kok-ebe FR, 88m, 08°26'58.17"N, 80°46'39.75"E, 24 April 2017, leg. N.P. Athukorala et al. (IFS_SAL_1129); 1 male, Central Province, Kandy District, Udawattakelle, 580m, 07°17'54"N, 80°38'29"E, litter, 29 December 2011, leg. S.P. Benjamin (IFS_SAL_342).

Etymology. This species is name in honor of our colleague and collector of the type material Ilesha Sandunika Ileperuma Arachchi.

Diagnosis. The species is similar to *S. lesserti* Reimoser, 1934 in body colorations and palpal structure (Caleb and Sanap 2016; Logunov and Azarkina 2018; Sebastian et al. 2015; Wesołowska 2014a). However it is distinguishable by the white curved transverse stripe behind the anterior eyes, white wavy pattern on anterior dorsal abdomen (Figs 4A–D), curved RTA (Figs 5C–D, F, 7B–C), bulbus with comparably shorter transversal ciliated rim of stiff setae (Figs 5E–F, 7A–B) and palpal femur with densely arranged white, long bristles in males (Fig. 5C), absence of red markings above anterior eye row, inconspicuous copulatory openings (Figs 6C–D, 7D) rounded, single chambered spermathecae, short and stout fertilization ducts in females (Figs 6E, 7E). *S. belihuloya*, lacks the characteristic ciliated rim running across bulb of the male palp.

Description. *Male (holotype):* Medium sized spiders. In life prosoma black, broadest posteriorly. Two longitudinal white stripe behind PLEs and white blotches at the lateral prosoma (Figs 4A–D). Ocular field slightly elevated and covered with white and pale brown bristles. Clypeus red, covered with dense light grey bristles. Eyes surrounded with reddish brown rings (Fig. 4D). Sternum oval (Fig. 5B). In Leg I, ventral sides of trochanter, femur covered with red blotches (Fig. 4D). Other legs pale brown with black banding patterns. Abdomen shield-shaped, dorsum pale brown adorned with black blotches and three white spots at the posterior abdomen (Figs 4A–C). Anterior border of abdomen with dense row of pale yellow long bristles (Figs 4A–C). Ventrum black from epigastric furrow to spinnerets in alcohol preserved specimens (Fig. 5B). Spinnerets black, dispersed with white hairs. Palp densely covered with white bristles (Figs 4B, D). Bulbus oval with triangular, posterior retrolateral apophysis and bulbus entirely covered by bag-like tegulum with anterior transversal fringe of long bristles and there is a crest covered with stiff setae (Figs 5E–F, 7A–B). Embolus short and stout accompanied by terminal apophyses (Figs 5F, 7B). RTA hook-like and curved ventrally (Figs 5C–D, F, 7B–C). Palpal tibia with single ventral tibial apophysis (Figs 5F, F, 7B). Measurements: TL 4.50, PL 2.25, PW at PLEs 1.80, AL 2.10, AW 1.55.

Female (paratype): All characters as in male, except the following: a pair of longitudinal white stripe arising from PLEs, lateral edges of prosoma bordered with white belts (Figs 4E–H), orange clypeus (Fig. 4G), front legs pale brown with blackish brown markings (Figs 4G–H), abdomen with single prominent white spot, two pale brown spots (Figs 4E–F). Epigyne moderately sclerotized. Copulatory opening inconspicuous (Figs 6C–D, 7D). Copulatory ducts short and broad. Spermathecae large, rounded (Figs 6 D–E, 7E). Fertilization ducts lanceolate arising from anterior wall of spermathecae (Figs 6E, 7E). Semicircular hole near basal plate. Posterior edge of epigynum with partially developed basal plate (Figs 6C–E, 7D–E). Measurements: TL 5.25, PL 2.65, PW at PLEs 2.05, AL 2.70, AW 2.00.

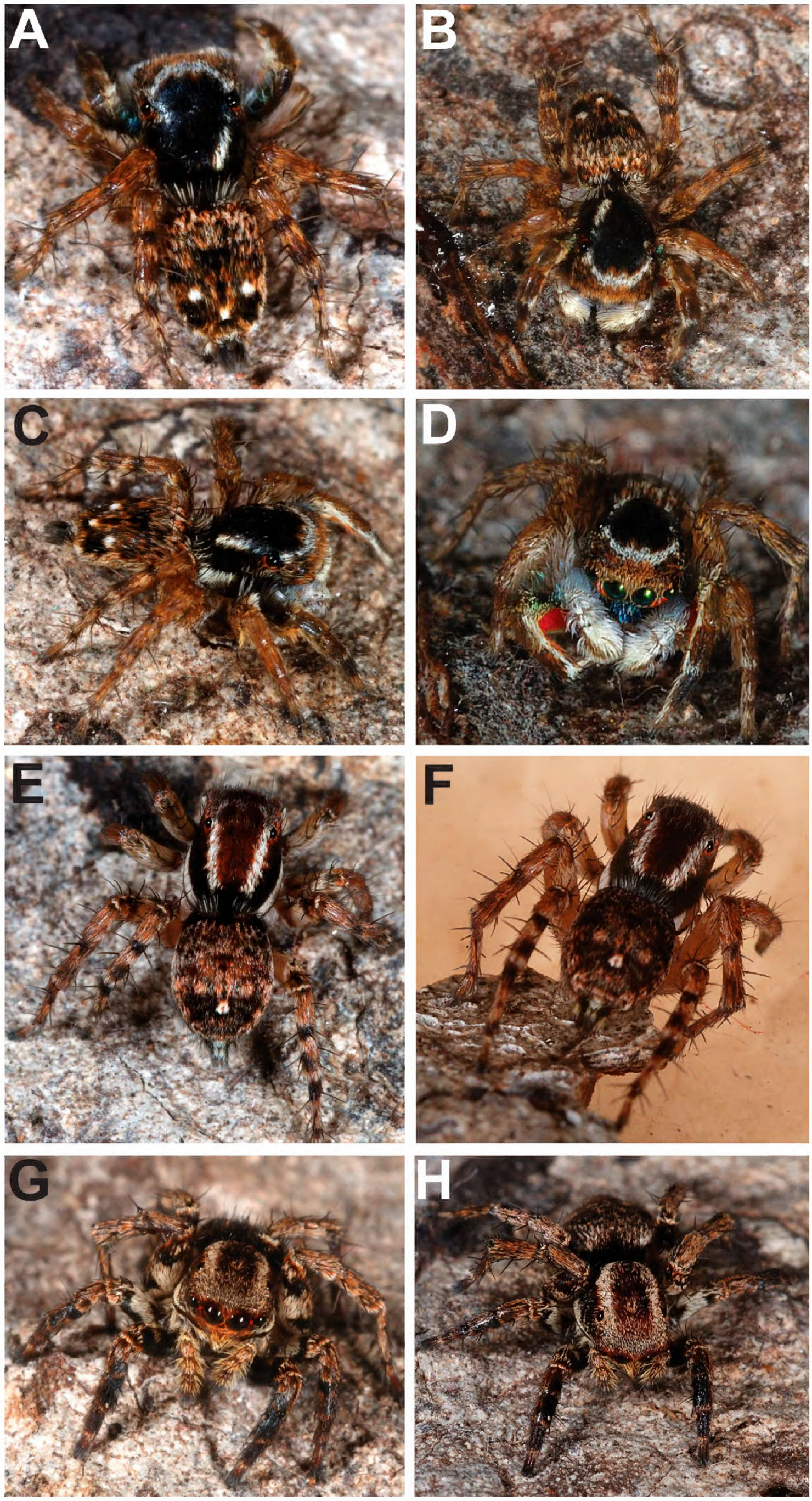

Figure 4. Live *Stenaelurillus ilesai* sp. nov. from Mihintale Sanctuary, **A–D** male **E–H** female.

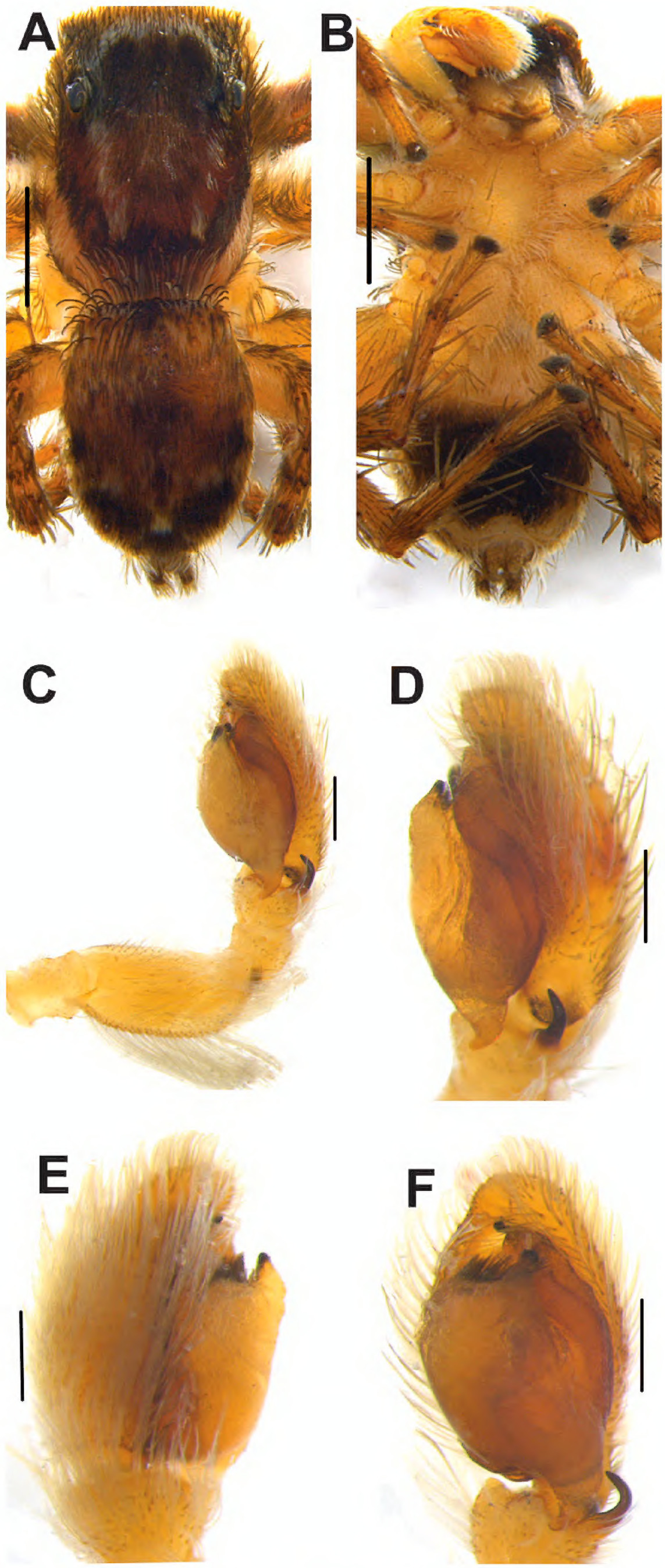

Figure 5. *Stenaelurillus ilesai* sp. nov. **A** habitus, male, dorsal view **B** ventral view **C** whole palp, retrolateral view **D** palp, retrolateral view **E** palp, prolateral view **F** palp, ventral view. Scale bars: 1 mm (**A–B**), 0.2 mm (**C–F**).

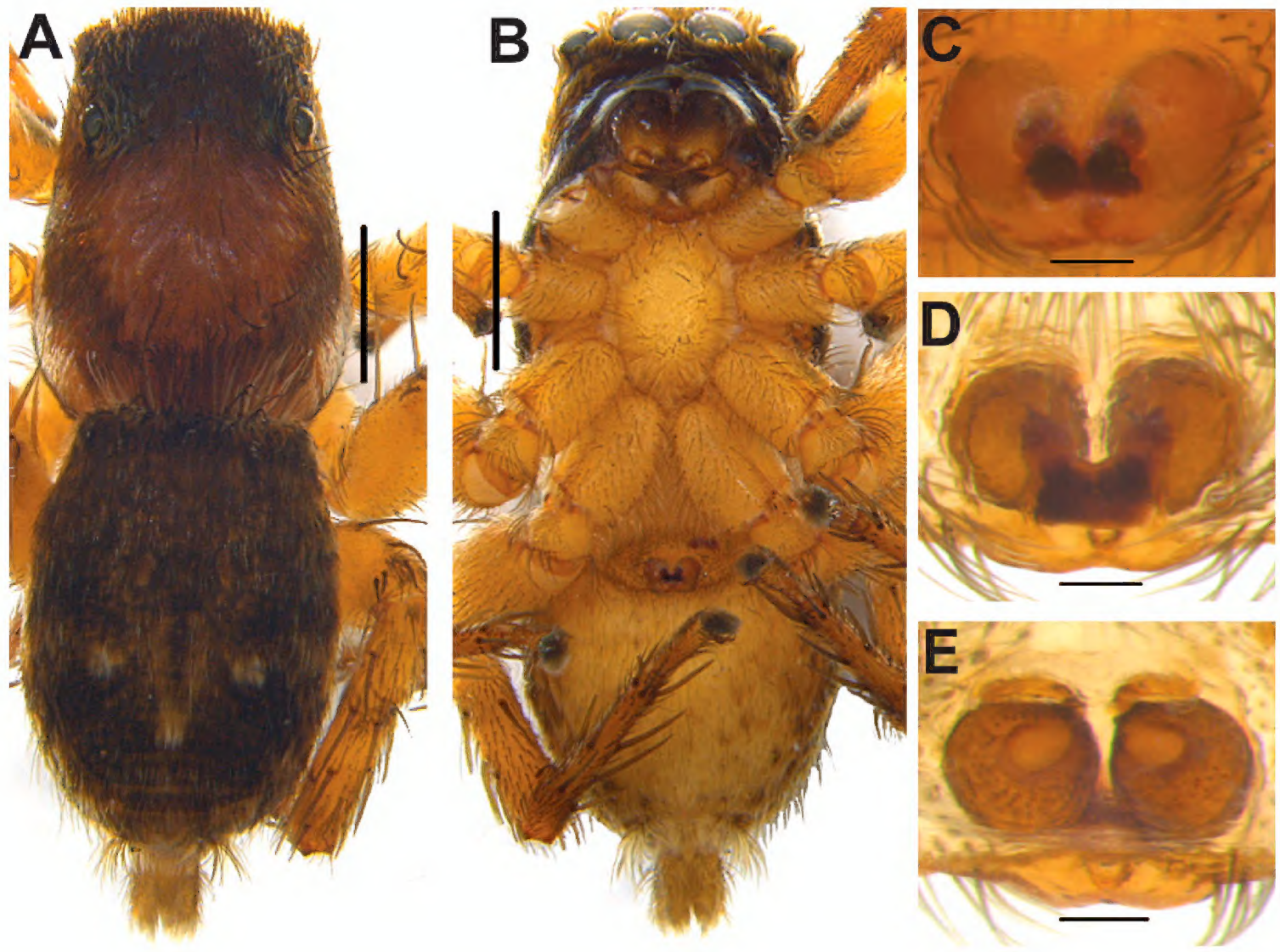

Figure 6. *Stenaelurillus ilesai* sp. nov. **A** habitus, female, dorsal view **B** ventral view **C–D** epigyne, ventral view **E** vulva, dorsal view. Scale bars: 1 mm (**A–B**), 0.1 mm (**C–E**).

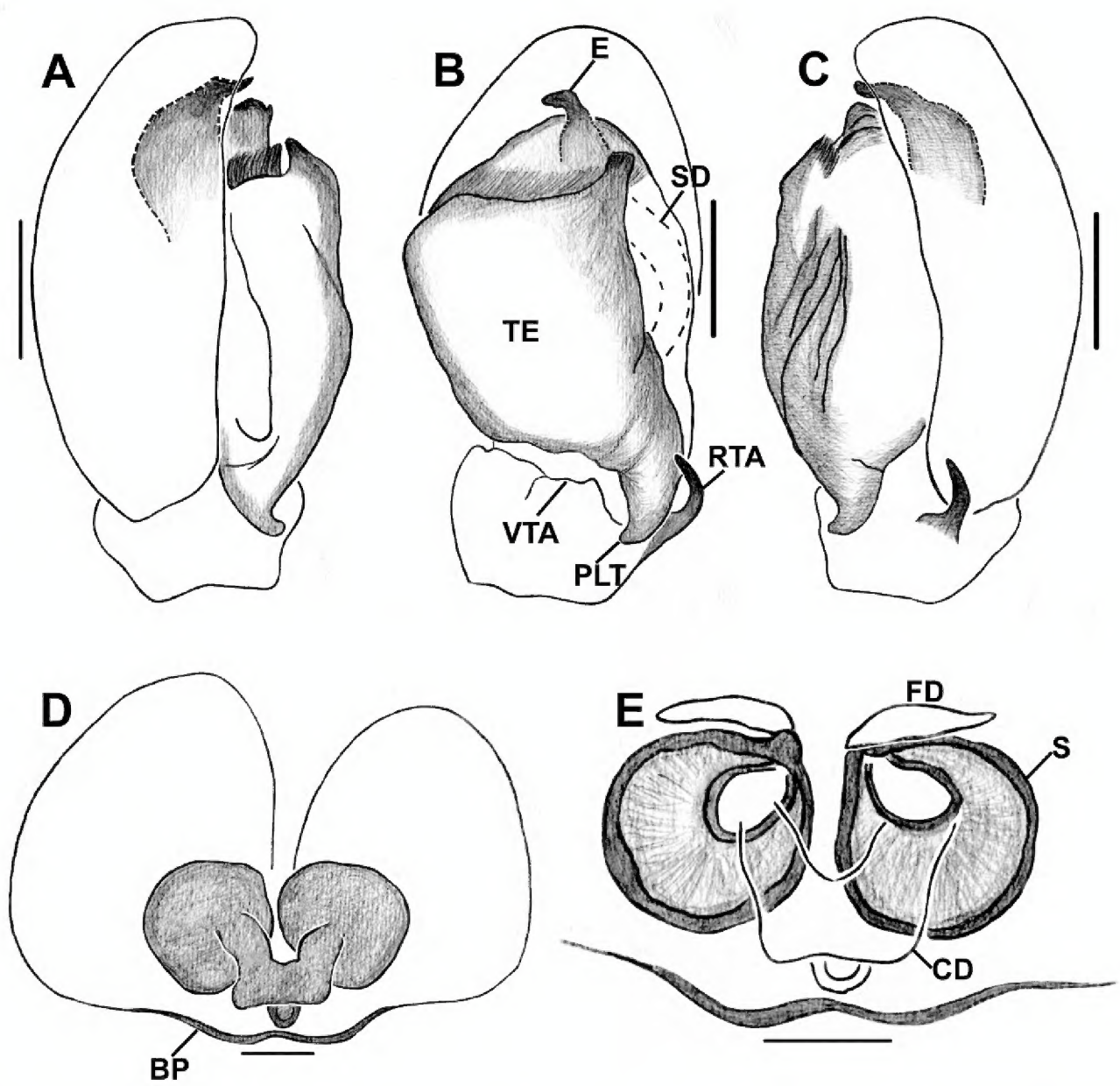

Figure 7. *Stenaelurillus ilesai* sp. nov. **A** palp, prolateral view **B** palp, ventral view **C** palp, retrolateral view **D** epigyne, ventral view **E** vulva, dorsal view. Abbreviations: BP, basal plate; CD, copulatory duct; E, embolus; FD, fertilization duct; PLT, proximal lobe of tegulum; RTA, retrolateral tibial apophysis; S, spermatheca; SD, sperm duct; TE, tegulum; VTA, ventral tibial apophysis. Scale bars: 0.2 mm (**A–C**), 0.1 mm (**D–E**).

Tamigalesus Żabka, 1988

Tamigalesus Żabka, 1988: 468. Type species *Tamigalesus munnaricus* from Sri Lanka

Description. Small ground dwelling jumping spiders. Abdomen smaller and narrower than prosoma (Żabka 1988). The bulb is modified with much elongated proximal bulbus with three terminal mounds (Figs 9C–E, 12A–D, 14C–E), two apophyses on patella and epigynum with pocket near epigastric furrow (Figs 10C–D, H–I, 11A–D), presence of lenticular structures joining copulatory ducts and spermathecae (Figs 10E, J, 11B, D) (Żabka 1988).

Tamigalesus munnaricus Żabka, 1988

Figs 8A–D, 9A–E, 10A–E, 11A–B, 12A–B

Material examined. 2 males Sri Lanka, Uva Province, Badulla District, Beragala, 1370m, 06°51'52"N, 81°03'01"E, 01 January 2012, hand collection, leg. S.P. Benjamin et al. (IFS_SAL_152-153); 1 male, 1 female Central Province, Kandy District, Peradeniya Botanical Gardens, 460m, 07°17'57"N, 80°38'29"E, 29-XII-2011, leg. Yuri Marusik (IFS_SAL_258-259); 1 male, Kandy District, Udawattakelle, 580m, 07°17'54"N, 80°38'29"E, 24 August 2016, litter, leg. I. Sandunika (IFS_SAL_869).

Remarks. Type material not examined. The illustration in Zabka (1988) was good enough to unambiguously identify our material.

Diagnosis. This species similar to *T. fabus* sp. nov. in genital structure, however it can be distinguishable by the presences of a comparably longer and curved embolus, end of posterior lobe with two unequal sized mounds (in ventral view) in males (Figs 9D–E, 12A–B) and comparably smaller epigynal pocket, large window-like, bilaterally arranged openings in females (Figs 10C–D, 11A–B).

Description. *Male:* In life prosoma high, pale brown adorned with orangish brown, black and pale white blotches (Figs 8A–D). Ocular field highly elevated and adorned with yellowish grey bristles. Ocular quadrangle square-shaped. Clypeus orangish brown with brown, long hairs and bristles (Figs 8A–D). Vicinity of eyes blackish brown, remaining part light brown (Żabka 1988). Chelicerae blackish brown with yellowish brown fangs in ethanol preserved specimens (Fig. 10A). Fovea distinct. Sternum oval with dispersed black colored spots (Fig. 10B). Whitish grey hairs sparsely dispersed on lateral prosoma. Lateral and posterior sides of prosoma much steeper. Posterior margin of prosoma slightly truncated. All legs with pale white, yellow and black banding pattern. Abdomen oval, greyish brown decorated with pale yellow dots and streaks, posteriorly bigger spots and chevrons on the middle (Figs 8A–D). Venter grey with black markings (Fig. 10B). Spinnerets yellowish grey. Yellowish brown palp. Bulbus with much elongated posterior lobe and its apex with three unequal sized mounds (Żabka 1988). Apical bulbus narrow and longitudinal, narrow cleft at the anterior bulbus (Figs 9D–E, 12A–B). Embolus long and thin originating from basal tegulum and then partially encircling bulbus with curved terminal tip (Figs 9D, 12A). RTA stout and short (Figs 9D–E, 12A–B). Patella with two broad ventral and ventro-lateral apophysis (Figs 9D–E, 12A–B). Part of sperm duct clearly visible at the distal tegulum. Measurements: TL 3.40, PL 1.90, PW at PLEs 1.35, AL 1.50, AW 1.00.

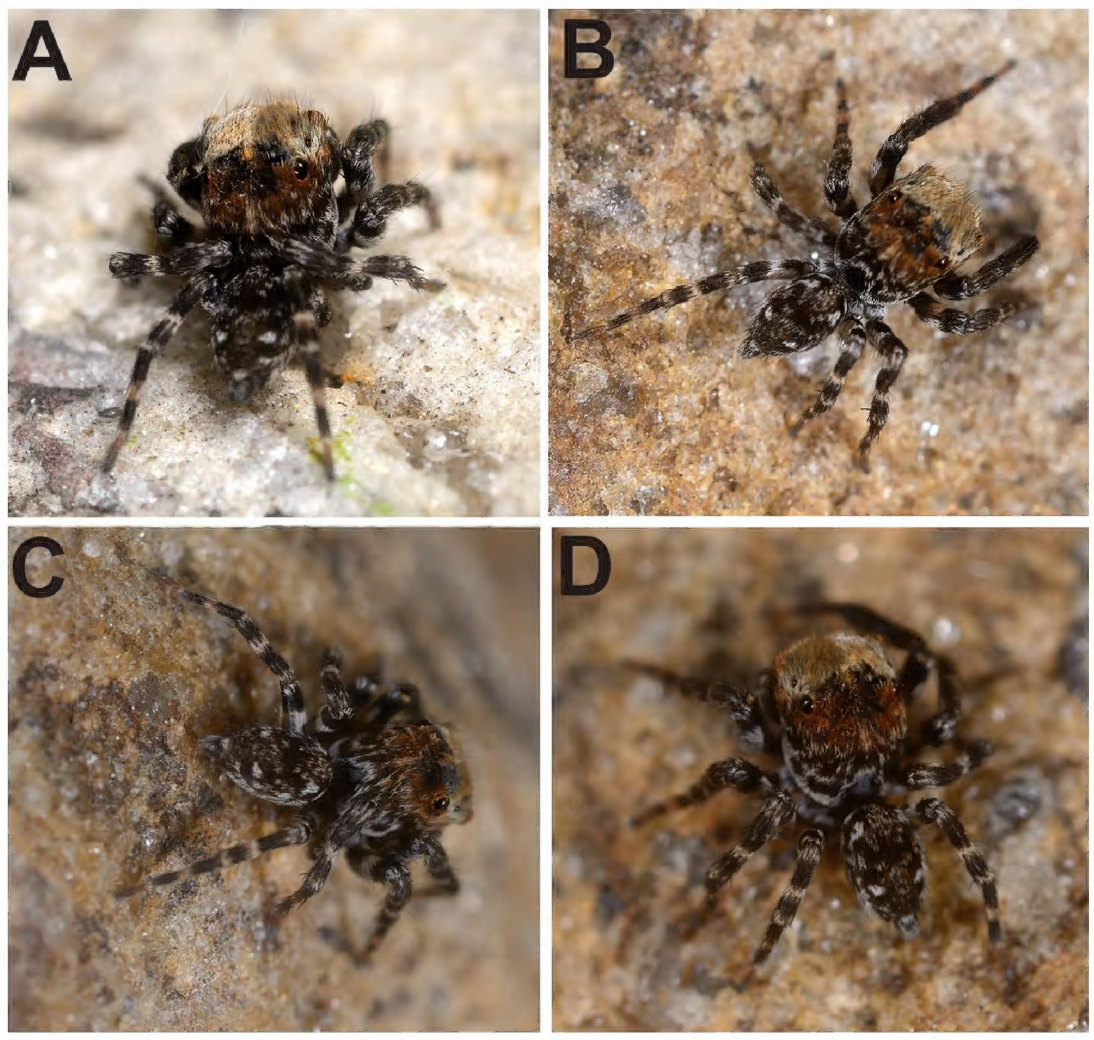

Figure 8. Live male of *Tamigalesus munnaricus* from Udawattakelle.

Female: All characters as in male, except the following: In alcohol preserved specimens, prosoma brown with pale white bristles, low prosomal height (Fig. 10A) when compared with males and orange clypeus with white, yellow bristles. Moderately sclerotized epigynum with large, bilaterally arranged window-like opening into which copulatory opening could open (Figs 10C, 11A). Copulatory ducts long, membranous and twisted with one coil (Figs 10D, 11B). Copulatory ducts leads to highly sclerotized, unusual structures with thick wall (it was mentioned as 'lenticular structure' in Żabka, 1988). Spermathecae roughly triangular-shape. Origin of fertilization ducts from anterior wall of spermathecae (Figs 10D, 11B). Epigynal pocket small and proximate to epigastric furrow (Figs 10C–D, 11A–B). Measurements: TL 4.75, PL 2.10, PW at PLEs 1.55, AL 2.05, AW 1.55.

Tamigalesus fabus sp. nov.

http://zoobank.org/AF47ED0B-4B5B-49CF-847F-54AEE859471E

Figs 10F–J, 11C–D, 12C–D, 13A–H, 14A–E

Type material. Male holotype from Sri Lanka, Southern Province, Galle District, Hiyare, Kombala-Kottawa Forest Reserve, 252m, 06°03'30"N, 80°18'55"E, 18 May 2010, litter, leg. S.P. Benjamin and S. Batuwita (IFS_SAL_686).

Paratype. One female, same locality and collection data as in the holotype except 24–26 May 2016, leg. N Athukorala et al. (IFS_SAL_752).

Other material examined. 1 male, same locality and collection data as in the holotype (IFS_SAL_160); 2 females, same locality and collection data as in paratype (IFS_SAL_1233-1234).

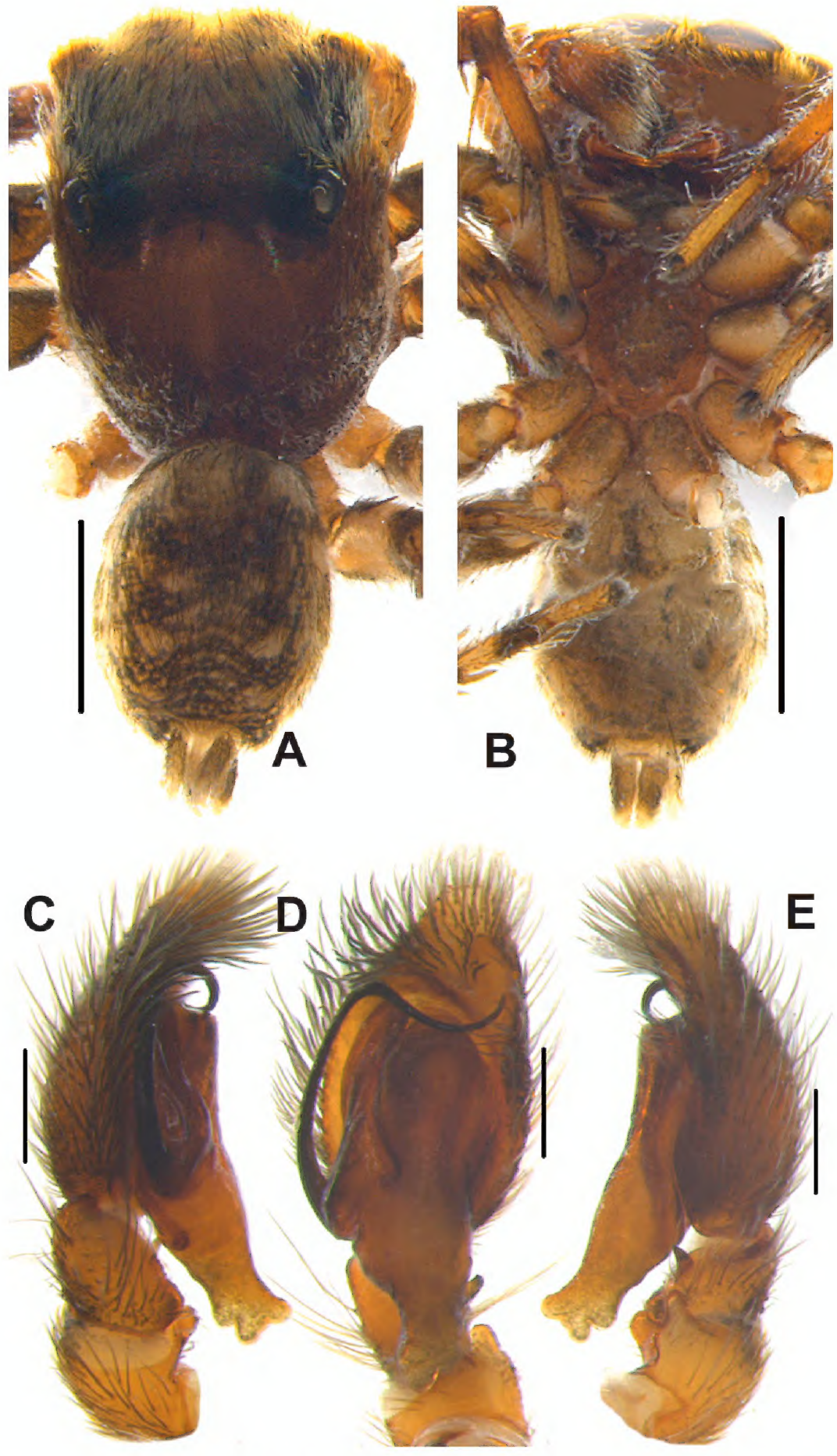

Figure 9. *Tamigalesus munnaricus* **A** habitus, male, dorsal view **B** ventral view **C** palp, prolateral view. **D.** Palp, ventral view **E** palp, retrolateral view. Scale bars: 1 mm (**A–B**), 0.2 mm (**C–E**).

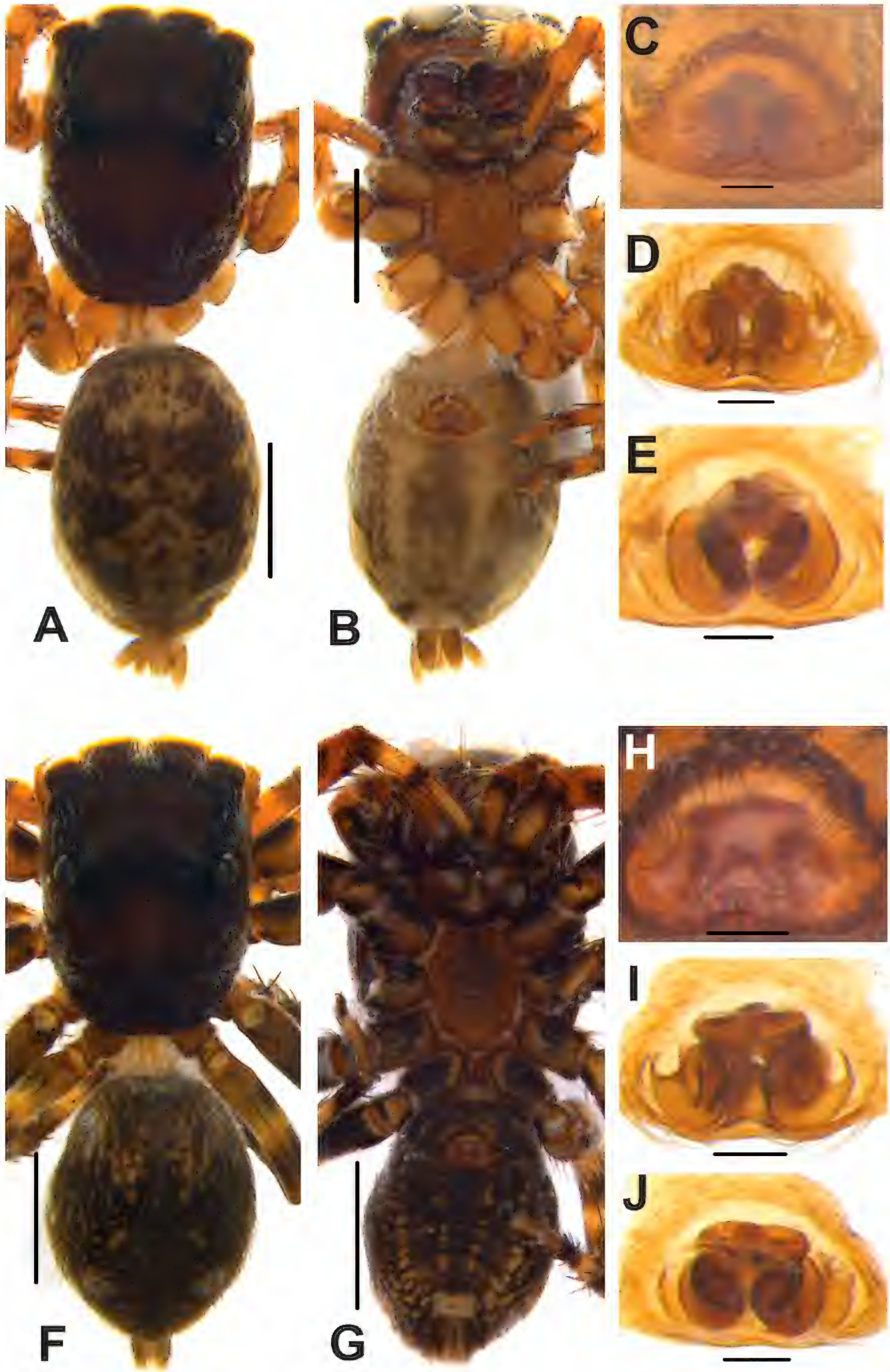

Figure 10. *Tamigalesus munnaricus* **A** habitus, female, dorsal view **B** ventral view **C–D** epigyne, ventral view **E** vulva, dorsal view. *Tamigalesus fabus* sp. nov. **F** habitus, female, dorsal view **G** ventral view **H–I** epigyne, ventral view **J** vulva, ventral view. Scale bars: 1 mm (**A–B**, **F–G**), 0.1 mm (**C–E**, **H–J**).

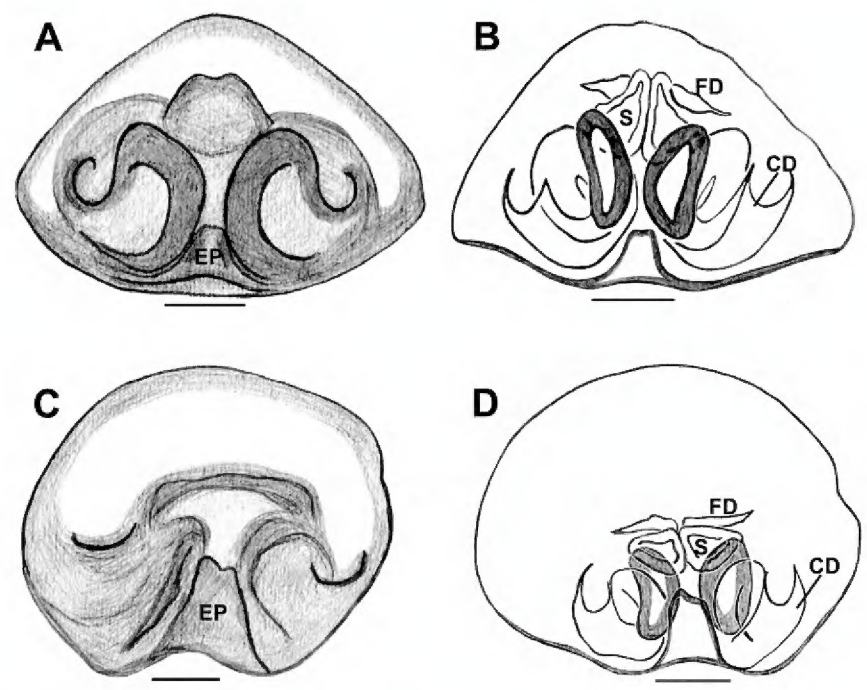

Figure 11. *Tamigalesus munnaricus* **A** epigyne, ventral view **B** vulva, dorsal view. *Tamigalesus fabus* sp. nov. **C** epigyne, ventral view **D** vulva, dorsal view. Abbreviations. CD, copulatory duct; EP, epigynal pocket; FD, fertilization duct; S, spermathecae. Scale bars: 0.1 mm.

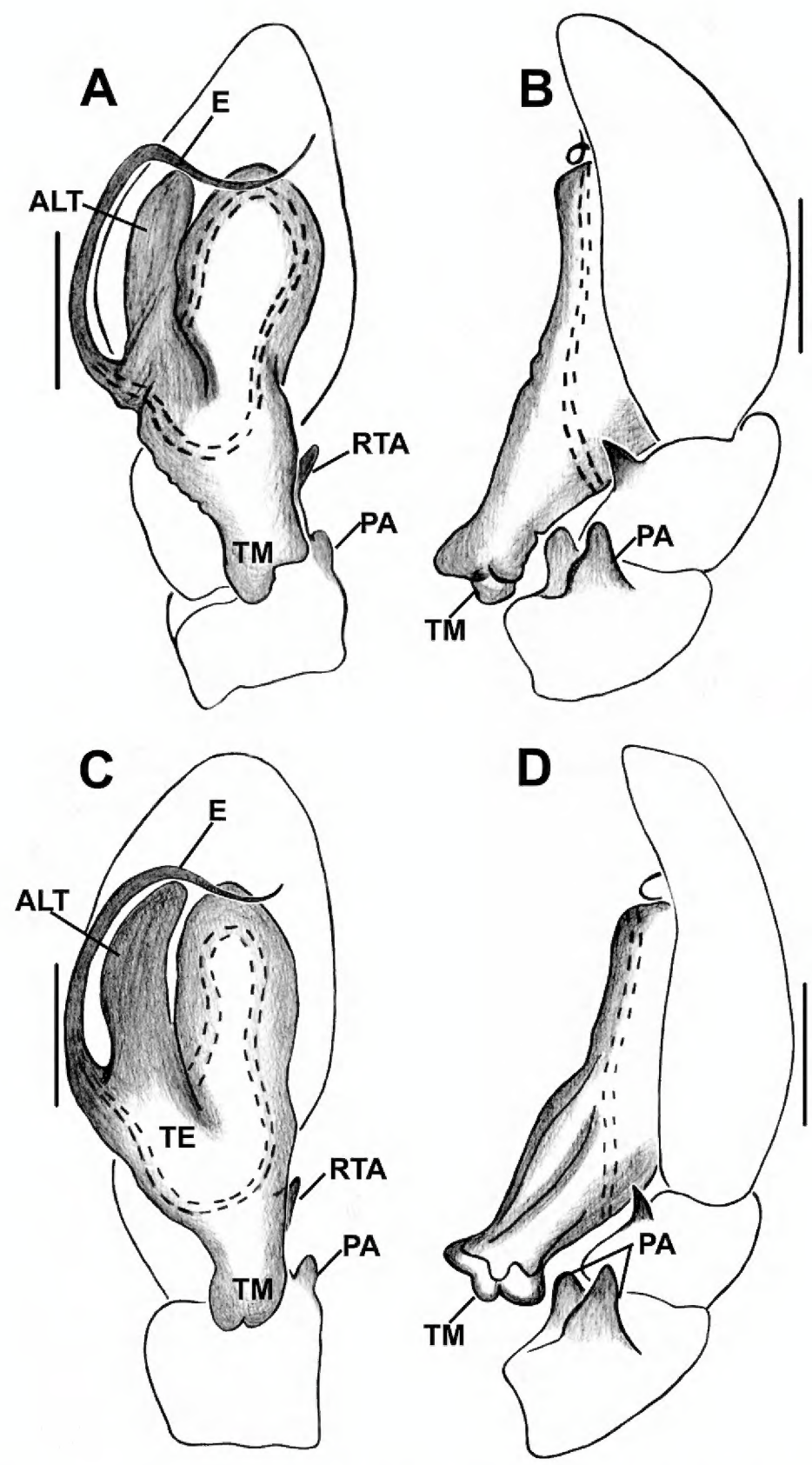

Figure 12. *Tamigalesus munnaricus* **A** palp, ventral view **B** palp, retrolateral view. *Tamigalesus fabus* sp. nov. **C** palp, ventral view **D** palp, retrolateral view. Abbreviations: ALT, apical lobe of tegulum; E, embolus; PA, patellar apophysis, RTA, retrolateral tibial apophysis; TE, tegulum; TM, tegular mound. Scale bars: 0.2 mm.

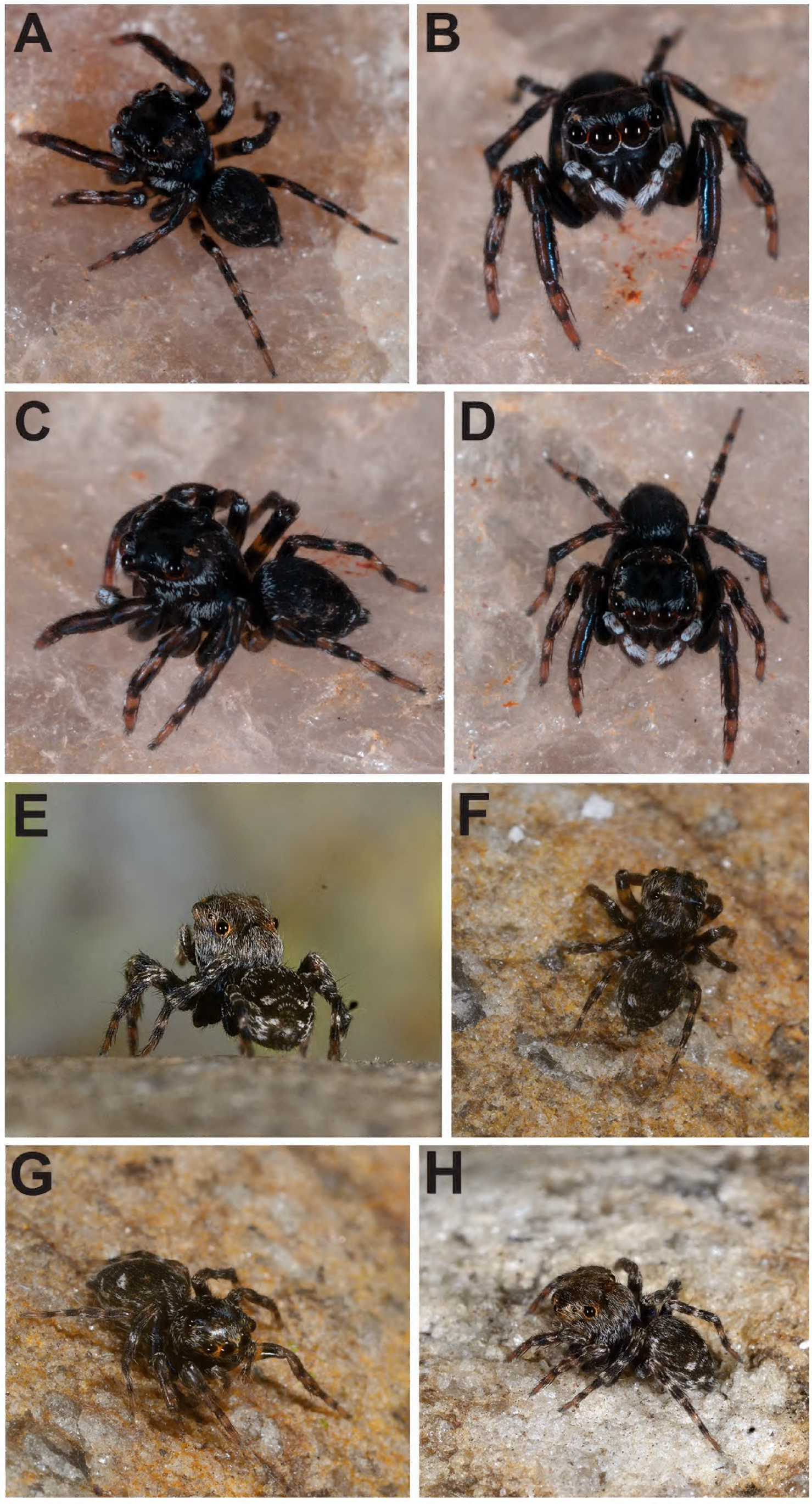

Figure 13. Live *Tamigalesus fabus* sp. nov. from Hiyare, Kombala-Kottawa forest reserve, **A–D** male; **E–H** female.

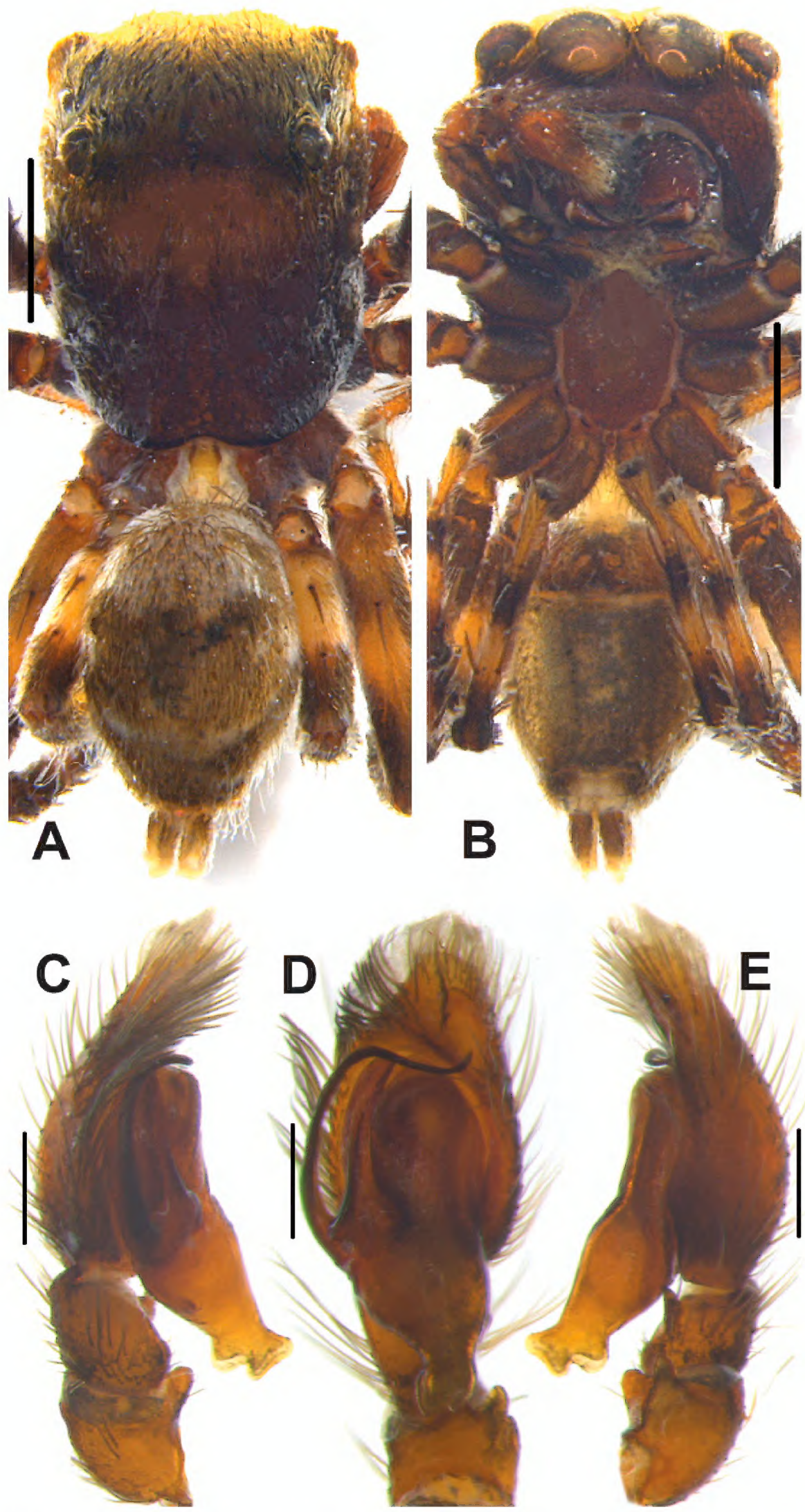

Figure 14. *Tamigalesus fabus* sp. nov. **A** habitus, male, dorsal view **B** ventral view **C** palp, prolateral view **D** palp, ventral view **E** palp, retrolateral view. Scale bars: 1 mm (**A–B**), 0.2 mm (**C–E**).

Etymology. The species name is an arbitrary combination of letters. Used as a noun in apposition.

Diagnosis. This species is closely related to *T. munnaricus* in genital structure, however it can be distinguished from it by having comparably shorter and slightly bent embolus, posterior lobe with two equal sized mounds (in ventral view) in males (Figs 12C–D, 14C–E) and comparably larger epigynal pocket, bracket-like bilaterally arranged openings in females (Figs 10H–I, 11C–D).

Description. *Male (holotype)*: In life prosoma high, brownish black, interspersed with white bristles and two rows of dense bristles on lateral sides (Figs 13A–D). Ocular field black and highly elevated. Black clypeus with brownish black hairs (Figs 13B, D). Anterior row of eyes covered with white bristles. Anterior and posterior halves of AMEs bordered with orange and white bristles respectively (Figs 13B, D). Chelicerae brown with yellowish brown fangs in ethanol preserved specimen

(Fig.14A). Fovea distinct. Oval sternum with dispersed black colored spots (Fig.14B). Lateral and posterior prosoma much steeper. Posterior border of prosoma slightly truncated. All legs with pale brown and black banding pattern. Abdomen oval, brownish black, dispersed with white bristles as in prosoma (Figs 13A, C). Ventrum grey with black markings (Fig.14B). Spinnerets black. Palp densely covered with long, white bristles. Bulbus with much elongated posterior lobe and its apex with three equal sized mounds (Figs 12C–D, 14C–E). There is a longitudinal cleft at the anterior bulbus resulting long, narrow and oval, blunted apical portions of bulbus (Figs 12C, 14D). Comparably shorter embolus originating from basal tegulum and then partially encircling bulbus with slightly curved tip (Figs 12C, 14D). RTA stout, short with a pointed tip (Figs 12D, 14E). Patella with two broad ventral and ventro-lateral apophyses (Figs 12C–D, 14C–E). Partial sperm duct clearly visible at the distal tegulum. Measurements: TL 4.50, PL 2.40, PW at PLEs 1.85, AL 1.75, AW 1.30.

Female (the paratype): All characters as in male, except as follows: Greyish black prosoma interspersed with white and grey bristles (Figs 13E–H), orange clypeus covered with grey bristles (Fig. 13G), abdomen with large, white blotches near the posterior region (Figs 13E–H) and ventrum blackish grey, adorned with pale yellow dots (Fig. 10G). Epigyne moderately sclerotized. At the midline, 'bracket' like bilaterally arranged openings into which copulatory opening could open (Figs 10H–I, 11C). Long and membranous copulatory ducts twisted with one coil leading to bean-shaped highly sclerotized structures with thick wall (Figs 10I–J, 11D). Triangular spermathecae from which fertilization ducts originates from anterior wall (Figs 10J, 11D). Large epigynal pocket extending from epigastric furrow to bean-shaped structures (Figs 10H–I, 11C–D). Measurements: TL 3.85, PL 2.15, PW at PLEs 1.55, AL 1.80, AW 1.40.

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